Ocean Observatories Initiative

Ocean Observatories Initiative: Data management in near-real-time

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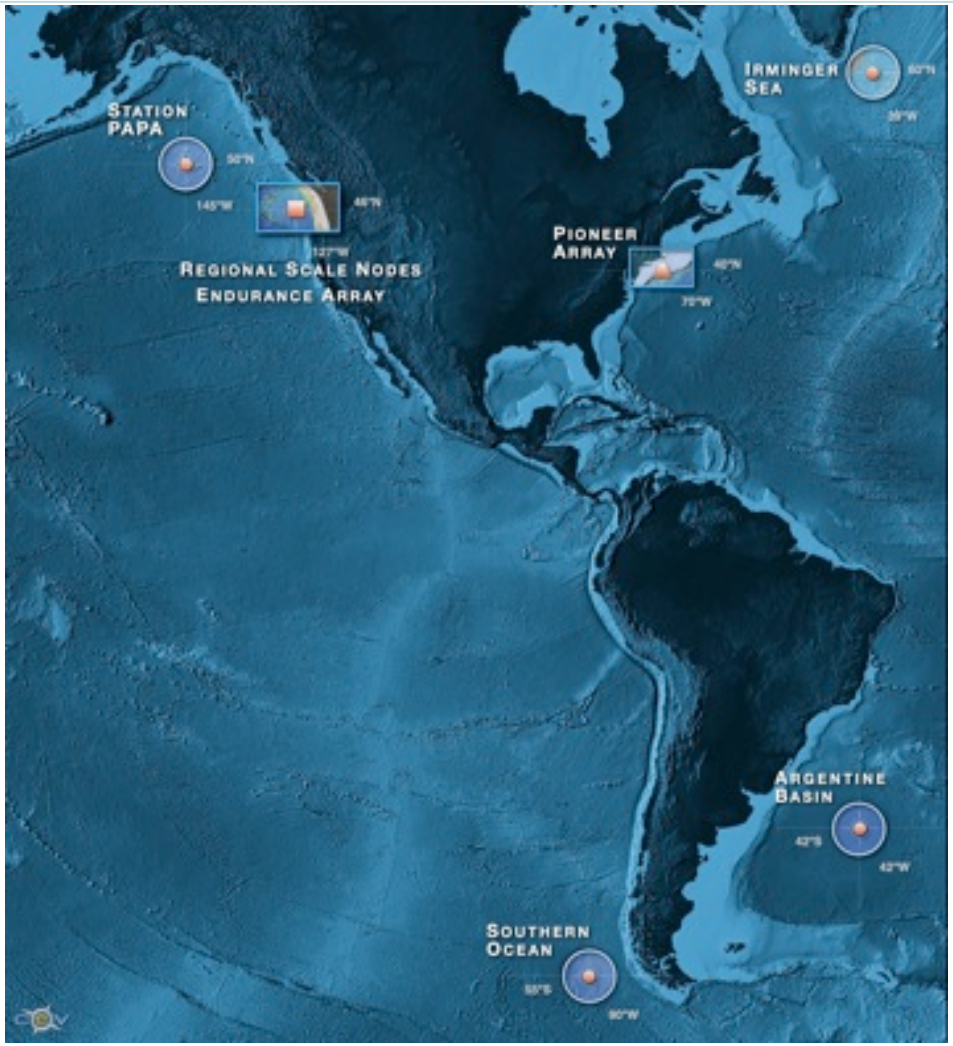
858 543-5009

I'm the data curator for OOI

Data policies and procedures, metadata, liaise with OOI scientists defining QC and derive products, external archive submission

OOI Marine Observatory Deployment Sites



Four high latitude sites

Station Papa
Irminger Sea
Argentine Basin
Southern Ocean

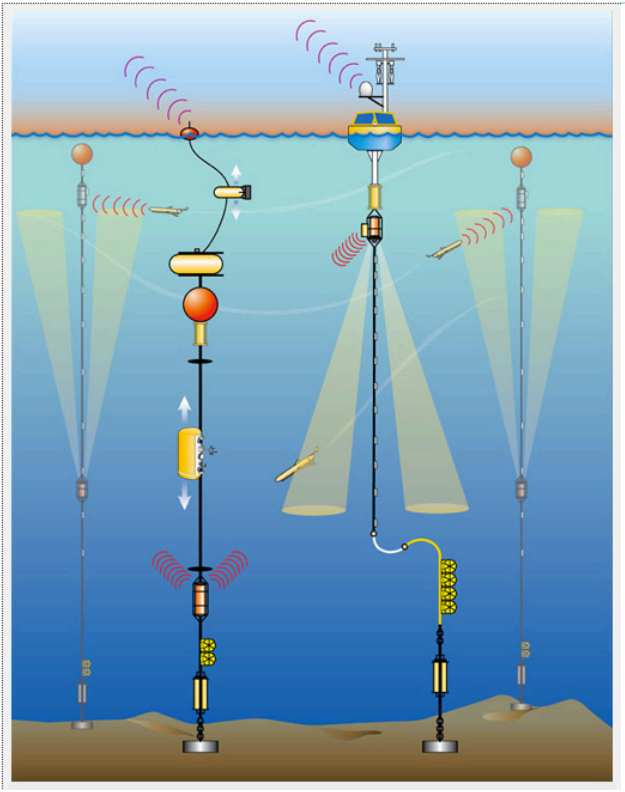
Two Coastal networks

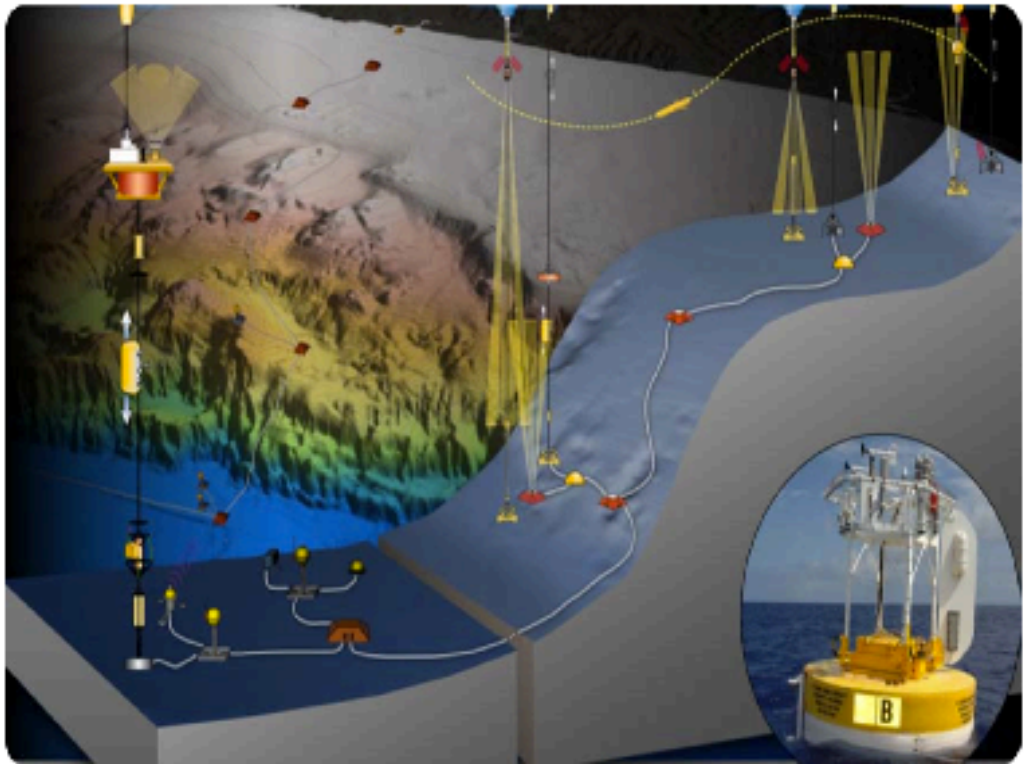
Endurance Array
Pioneer Array

Regional cabled network

plate scale seafloor observations

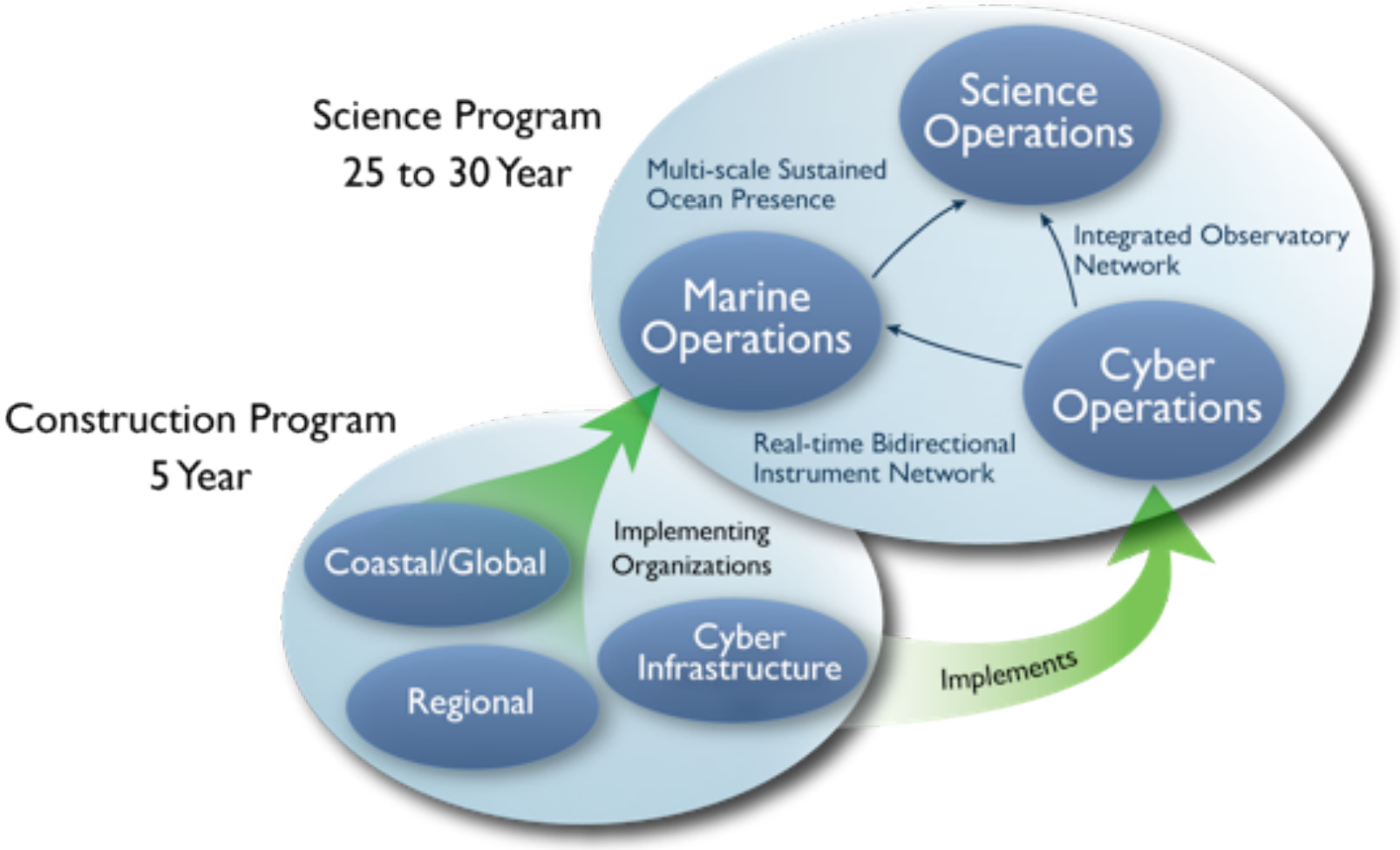
Instrumentation



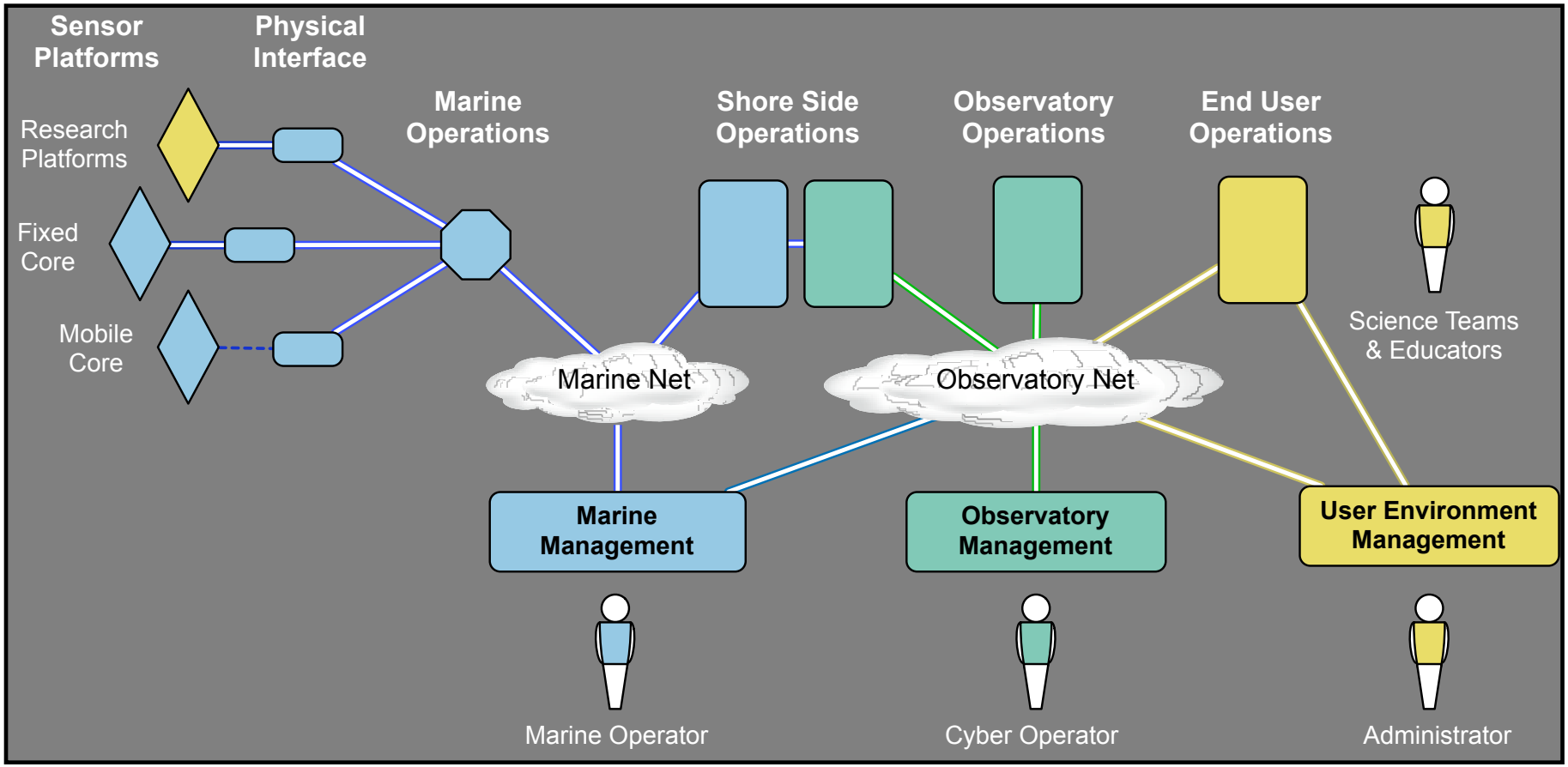


>800 instruments of 49 types

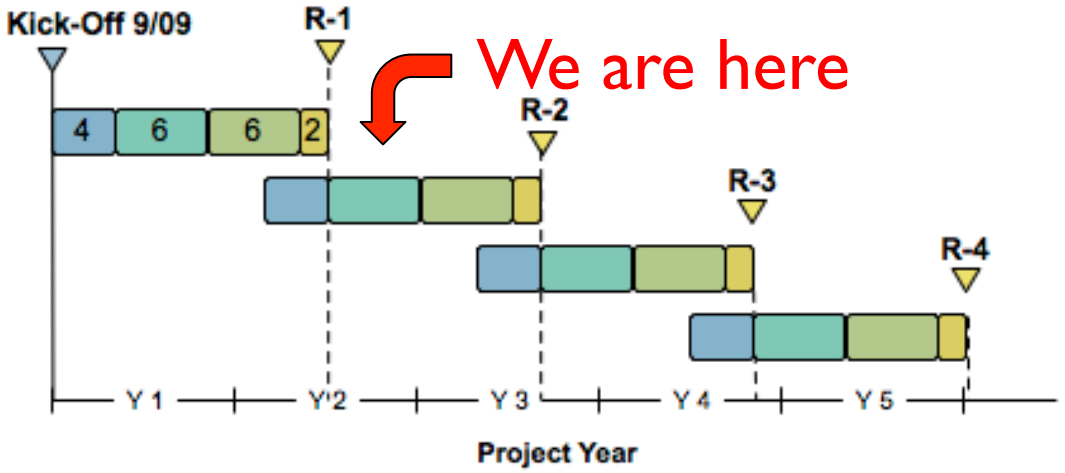
Timeframe


Science Program
25 to 30 Year
Science Operations
Multi-scale Sustained
Ocean Presence
Integrated Observatory
Network
Marine
Operations
Cyber
Operations
Real-time Bidirectional
Instrument Network
Construction Program
5 Year
Coastal/Global
Implementing
Organizations
Cyber
Infrastructure
Regional
Implements

Cyberinfrastructure



Spiral Development



- Next Release 2 (late 2012): "managed instrument network"
  - Instrument operation
  - Data product generation

Release 3 – Late 2013

- First broad public release supporting scientists, education, and the public.
- The "externalization" of OOI CI will be fully developed in Release 3
  - data formats, services, and standards for interoperability with external communities and applications

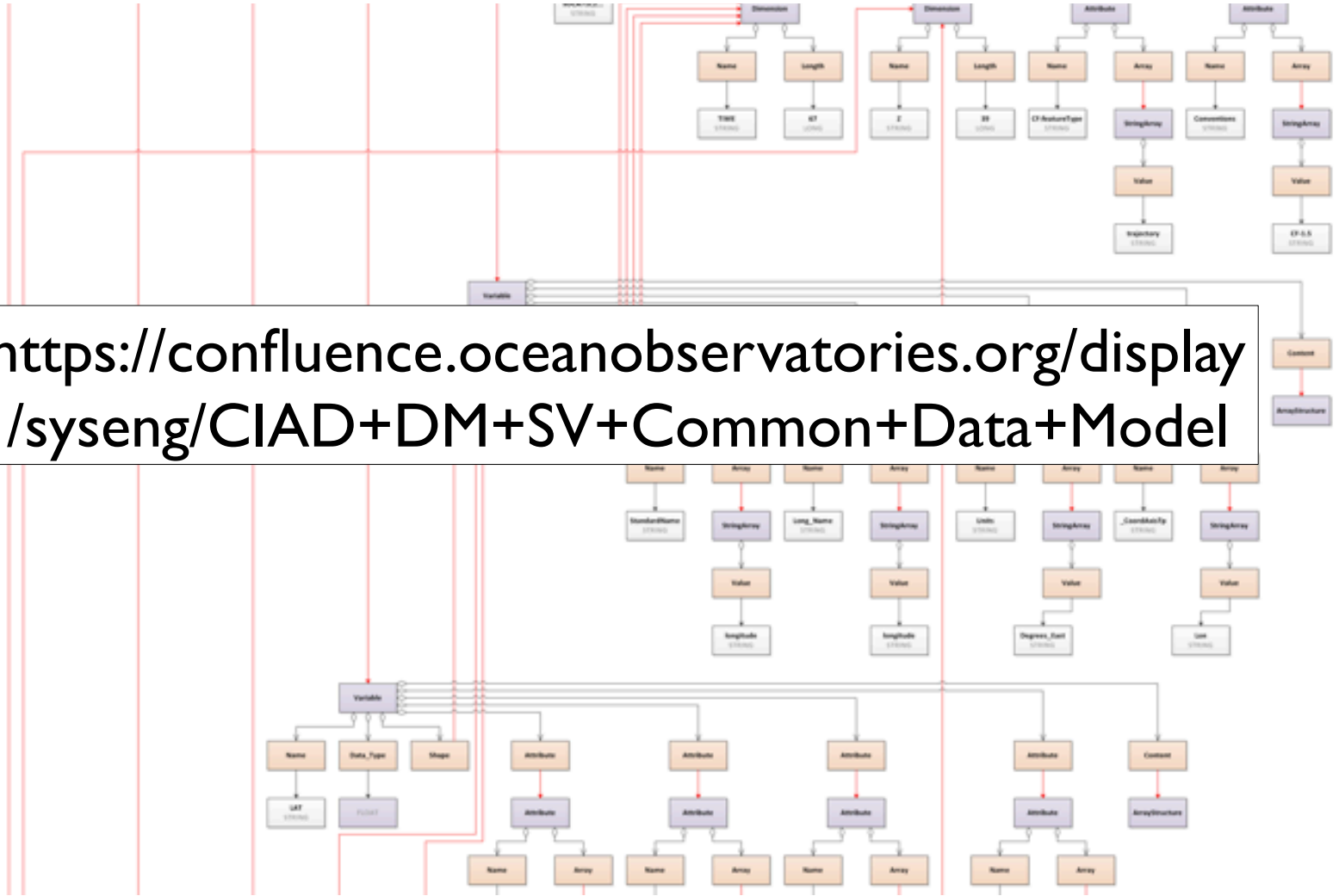
The OOI Data Model

The (Un)Common Data Model

What is the OOI Data Model, Answer #1

An extension of the Unidata CDM to incorporate the ISO 19123 coverage model based on explicit representation of relationships – the mesh on which the data exists. By leveraging mesh manipulation technologies from the Finite Element Modeling community, the subtypes of Geographic Feature collapse and can be treated similarly.

What is the OOI Data Model, Answer #2

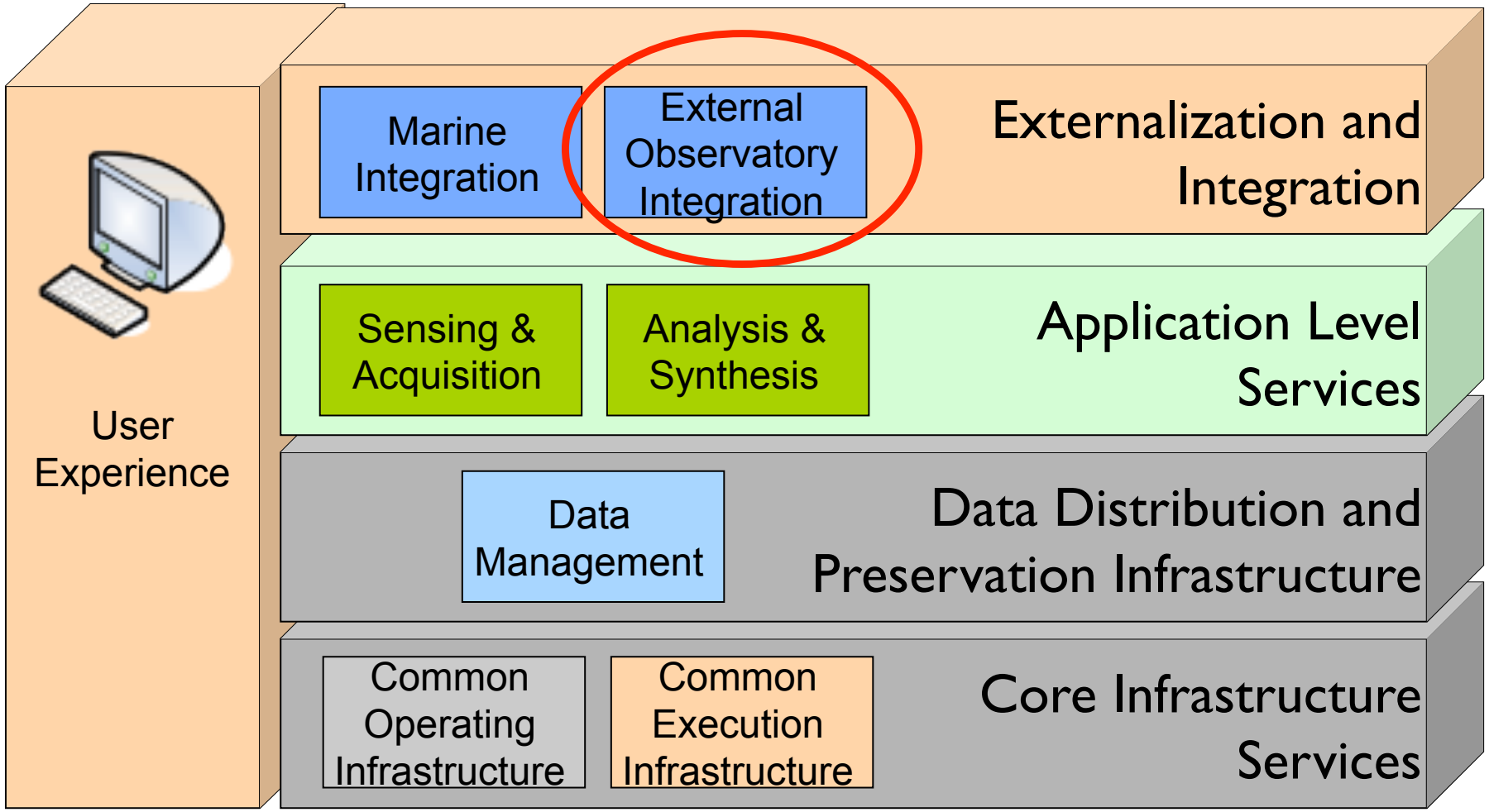


https://confluence.oceanobservatories.org/display/syseng/CIAD+DM+SV+Common+Data+Model

What is the OOI Data Model, Answer #3

It doesn't matter. OOI providers and users won't need to interact with the internal model.

System Architecture: Subsystem Layers



http://www.oceanobservatories.org/spaces/display/syseng/CIAD+OV+01+Decomposition

Conventions

OGC services

SOS

THREDDS

Attribute Conventions
for Dataset Discover

GML

NetCDF

CF

ISO

- 19115
- 19123 - coverages
- eval. 19157 - quality

DAP

PyDAP

The External Observatories Integration (EOI)

- EOI externalize the Integrated Observatory system, **making it interoperable** with select target communities. **The initial target community is NOAA IOOS**, represented by specific members of the modeling community. (Later communities include NEPTUNE Canada and the World Meteorological Organization.
- **Present the OOI-CI using the same interface as the existing IOOS Regional Associations** (RA's)
  - Enable acquisition of science data from external observatories (**DAP, SOS, HFR, Glider, MetOcean Models**)
  - Distribution of OOI-CI data via the services/protocols used by the IOOS RA's (**DAP, SOS**)

Integrated Technologies

Science Metadata Model: **SWE Common 2.0** and **GML 3.2.1**

- SWE record description provides a rich semantics for the science metadata including UCUM units, OGC property and quantity definitions and EPSG coordinate systems
- GML model of coverage composed of domain and range is used to extend the SWE Quantity and Vector providing the connection between the metadata description of variables and the OOICI Science CDM model of fields and topology.
- Currently used as science metadata object model (for transport and persistence)

Metadata are captured in several ways

All entities in OOI system is a resource (data products, data processes, instruments, platforms). Each resource can have:

- attributes
- associations with other resources, e.g. quality flags associated with a data product, process associated with a derived product.
- attachments, e.g. a user manual attached to an instrument. (Really just a sub-class of the above)

https://confluence.oceanobservatories.org/display/syseng/CIAD+APP+Resource+Model

Accessing Data in OOI

1. Services

OGC services

SOS

THREDDS

Attribute Conventions
for Dataset Discover

GML

NetCDF

CF

ISO

- 19115
- 19123 - coverages
- eval. 19157 - quality

DAP

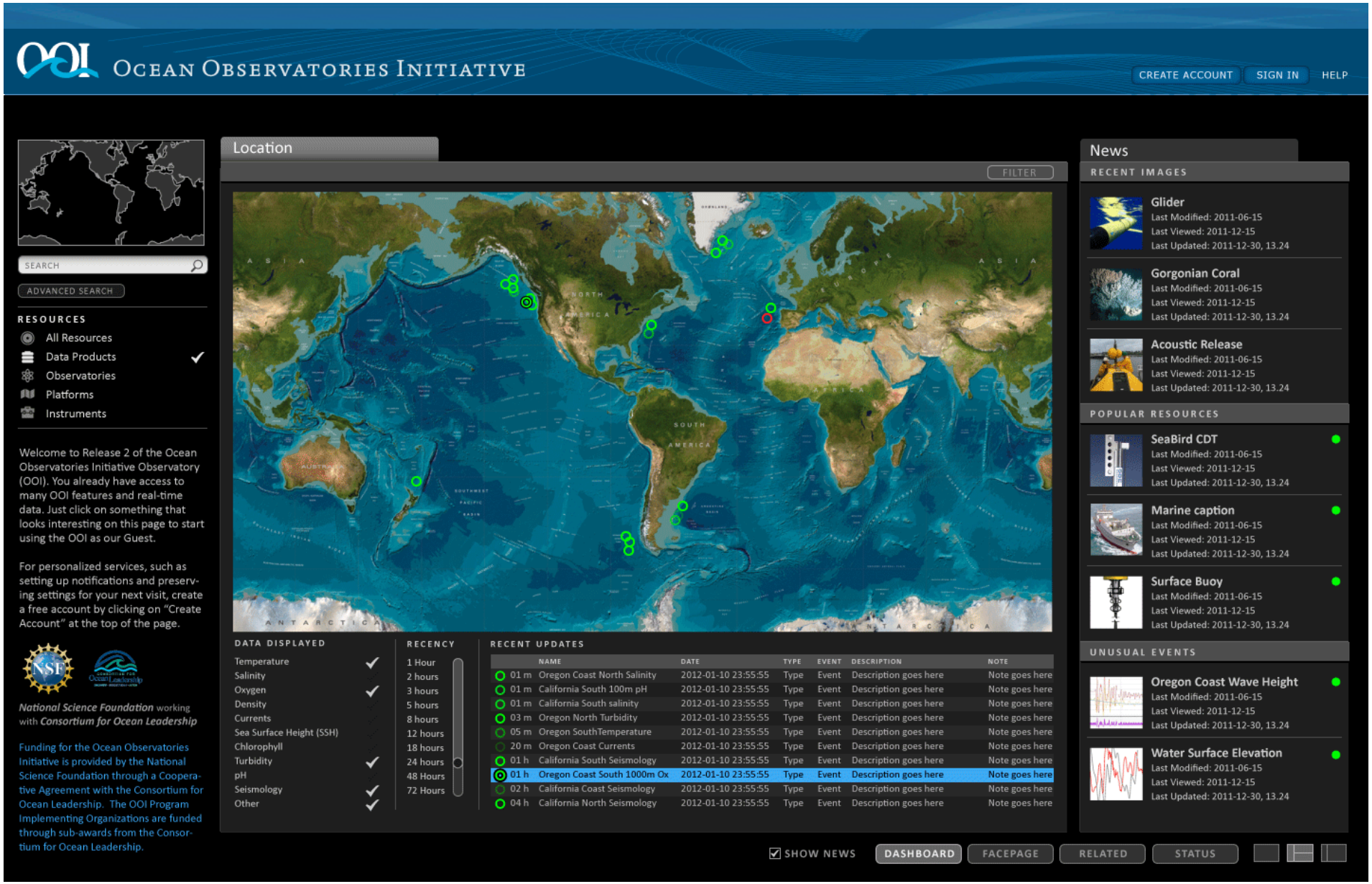
PyDAP

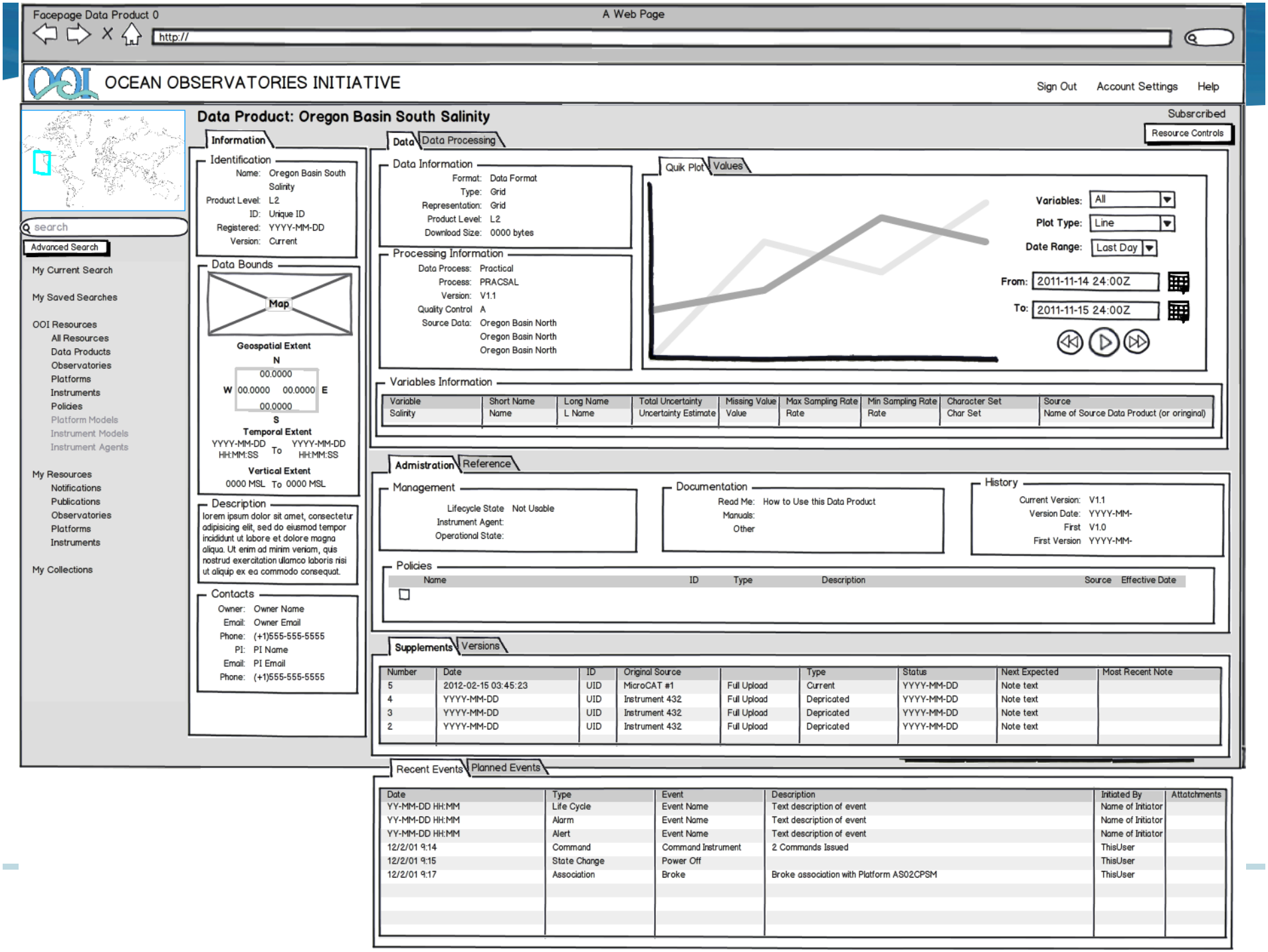
2. Publication/Subscription System

- Designed for near-real-time use
- The user defines:
  - the data stream(s) they are interested in (by parameter, instrument, region, etc)
  - any transformations (e.g. subsetting, aggregation, unit conversions)
  - format
  - desired update frequency (every 1 hour, every 10 new records)
  - delivery mechanism (e.g. RSS, email, message Twitter)

3. User Interface

- For Release 2 (instrument operators and data producers)
- In development – these are artists renditions
- If anyone is interested in having input into the finalization of the user interface, please contact Susanne Jul: sjul@acm.org


OCEAN OBSERVATORIES INITIATIVE
CREATE ACCOUNT
SIGN IN
HELP
SEARCH
ADVANCED SEARCH
RESOURCES
All Resources
Data Products
Observatories
Platforms
Instruments
Welcome to Release 2 of the Ocean Observatories Initiative Observatory (OOI). You already have access to many OOI features and real-time data. Just click on something that looks interesting on this page to start using the OOI as our Guest.
For personalized services, such as setting up notifications and preserving settings for your next visit, create a free account by clicking on "Create Account" at the top of the page.
National Science Foundation working with Consortium for Ocean Leadership
Funding for the Ocean Observatories Initiative is provided by the National Science Foundation through a Cooperative Agreement with the Consortium for Ocean Leadership. The OOI Program Implementing Organizations are funded through sub-awards from the Consortium for Ocean Leadership.
Location
FILTER
DATA DISPLAYED
Temperature
Salinity
Oxygen
Density
Currents
Sea Surface Height (SSH)
Chlorophyll
Turbidity
pH
Seismology
Other
RECENCY
1 Hour
2 hours
3 hours
5 hours
8 hours
12 hours
18 hours
24 hours
48 Hours
72 Hours
RECENT UPDATES
NAME DATE TYPE EVENT DESCRIPTION NOTE
01 m Oregon Coast North Salinity 2012-01-10 23:55:55 Type Event Description goes here Note goes here
01 m California South 100m pH 2012-01-10 23:55:55 Type Event Description goes here Note goes here
01 m California South salinity 2012-01-10 23:55:55 Type Event Description goes here Note goes here
03 m Oregon North Turbidity 2012-01-10 23:55:55 Type Event Description goes here Note goes here
05 m Oregon SouthTemperature 2012-01-10 23:55:55 Type Event Description goes here Note goes here
20 m Oregon Coast Currents 2012-01-10 23:55:55 Type Event Description goes here Note goes here
01 h California South Seismology 2012-01-10 23:55:55 Type Event Description goes here Note goes here
01 h Oregon Coast South 1000m Ox 2012-01-10 23:55:55 Type Event Description goes here Note goes here
02 h California Coast Seismology 2012-01-10 23:55:55 Type Event Description goes here Note goes here
04 h California North Seismology 2012-01-10 23:55:55 Type Event Description goes here Note goes here
News
RECENT IMAGES
Glider
Last Modified: 2011-06-15
Last Viewed: 2011-12-15
Last Updated: 2011-12-30, 13.24
Gorgonian Coral
Last Modified: 2011-06-15
Last Viewed: 2011-12-15
Last Updated: 2011-12-30, 13.24
Acoustic Release
Last Modified: 2011-06-15
Last Viewed: 2011-12-15
Last Updated: 2011-12-30, 13.24
POPULAR RESOURCES
SeaBird CDT
Last Modified: 2011-06-15
Last Viewed: 2011-12-15
Last Updated: 2011-12-30, 13.24
Marine caption
Last Modified: 2011-06-15
Last Viewed: 2011-12-15
Last Updated: 2011-12-30, 13.24
Surface Buoy
Last Modified: 2011-06-15
Last Viewed: 2011-12-15
Last Updated: 2011-12-30, 13.24
UNUSUAL EVENTS
Oregon Coast Wave Height
Last Modified: 2011-06-15
Last Viewed: 2011-12-15
Last Updated: 2011-12-30, 13.24
Water Surface Elevation
Last Modified: 2011-06-15
Last Viewed: 2011-12-15
Last Updated: 2011-12-30, 13.24
SHOW NEWS
DASHBOARD
FACEPAGE
RELATED
STATUS


Facepage Data Product 0
A Web Page
http://
OCEAN OBSERVATORIES INITIATIVE
Sign Out
Account Settings
Help
search
Advanced Search
My Current Search
My Saved Searches
OOI Resources
All Resources
Data Products
Observatories
Platforms
Instruments
Policies
Platform Models
Instrument Models
Instrument Agents
My Resources
Notifications
Publications
Observatories
Platforms
Instruments
My Collections
Data Product: Oregon Basin South Salinity
Subsrcribed
Resource Controls
Information
Identification
Name: Oregon Basin South Salinity
Product Level: L2
ID: Unique ID
Registered: YYYY-MM-DD
Version: Current
Data Bounds
Map
Geospatial Extent
N
00.0000
W 00.0000 00.0000 E
00.0000
S
Temporal Extent
YYYY-MM-DD HH:MM:SS To YYYY-MM-DD HH:MM:SS
Vertical Extent
0000 MSL To 0000 MSL
Description
lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.
Contacts
Owner: Owner Name
Email: Owner Email
Phone: (+1)555-555-5555
PI: PI Name
Email: PI Email
Phone: (+1)555-555-5555
Data
Data Processing
Data Information
Format: Data Format
Type: Grid
Representation: Grid
Product Level: L2
Download Size: 0000 bytes
Processing Information
Data Process: Practical
Process: PRACSAL
Version: V1.1
Quality Control A
Source Data: Oregon Basin North
Oregon Basin North
Oregon Basin North
Quik Plot
Values
Variables: All
Plot Type: Line
Date Range: Last Day
From: 2011-11-14 24:00Z
To: 2011-11-15 24:00Z
Variables Information
Variable Salinity
Short Name Name
Long Name L Name
Total Uncertainty Uncertainty Estimate
Missing Value Value
Max Sampling Rate Rate
Min Sampling Rate Rate
Character Set Char Set
Source Name of Source Data Product (or oringinal)
Admistration
Reference
Management
Lifecycle State Not Usable
Instrument Agent:
Operational State:
Documentation
Read Me: How to Use this Data Product
Manuals:
Other
History
Current Version: V1.1
Version Date: YYYY-MM-
First V1.0
First Version YYYY-MM-
Policies
Name ID Type Description Source Effective Date
Supplements
Versions
Number Date ID Original Source Type Status Next Expected Most Recent Note
5 2012-02-15 03:45:23 UID MicroCAT #1 Full Upload Current YYYY-MM-DD Note text
4 YYYY-MM-DD UID Instrument 432 Full Upload Depricated YYYY-MM-DD Note text
3 YYYY-MM-DD UID Instrument 432 Full Upload Depricated YYYY-MM-DD Note text
2 YYYY-MM-DD UID Instrument 432 Full Upload Depricated YYYY-MM-DD Note text
Recent Events
Planned Events
Date Type Event Description Initiated By Attatchments
YY-MM-DD HH:MM Life Cycle Event Name Text description of event Name of Initiator
YY-MM-DD HH:MM Alarm Event Name Text description of event Name of Initiator
YY-MM-DD HH:MM Alert Event Name Text description of event Name of Initiator
12/2/01 9:14 Command Command Instrument 2 Commands Issued ThisUser
12/2/01 9:15 State Change Power Off ThisUser
12/2/01 9:17 Association Broke Broke association with Platform AS02CPSM ThisUser

Data | Data Processing

Data Information

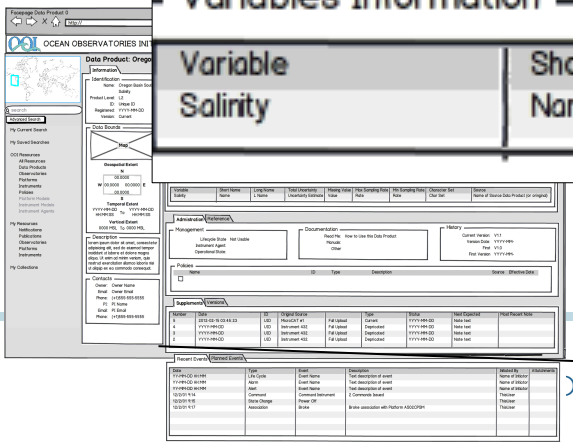
Format:	Data Format
Type:	Grid
Representation:	Grid
Product Level:	L2
Download Size:	0000 bytes

Processing Information

Data Process:	Practical
Process:	PRACSAL
Version:	V1.1
Quality Control	A
Source Data:	Oregon Basin North
	Oregon Basin North
	Oregon Basin North

Variables Information

Variable	Short Name	Long Name	T
Salirity	Name	L Name	U



Information

Identification

Name:	Oregon Basin South Salirity
Product Level:	L2
ID:	Unique ID
Registered:	YYYY-MM-DD
Version:	Current

Data Bounds

Map

Geospatial Extent

N 00.0000

W 00.0000 00.0000 E

00.0000 S

Temporal Extent

YYYY-MM-DD HH:MM:SS To YYYY-MM-DD HH:MM:SS

Vertical Extent

0000 MSL To 0000 MSL

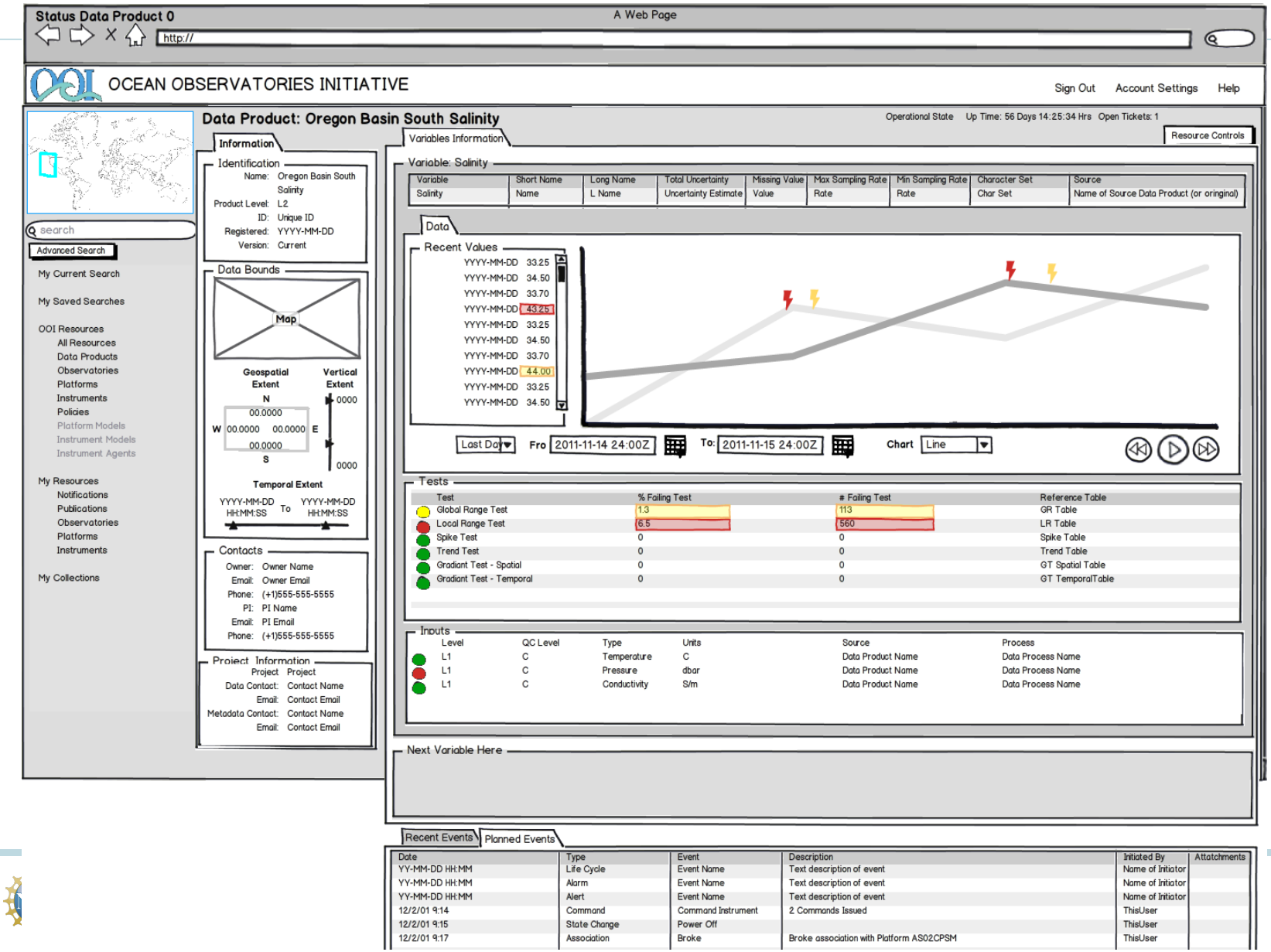
Description

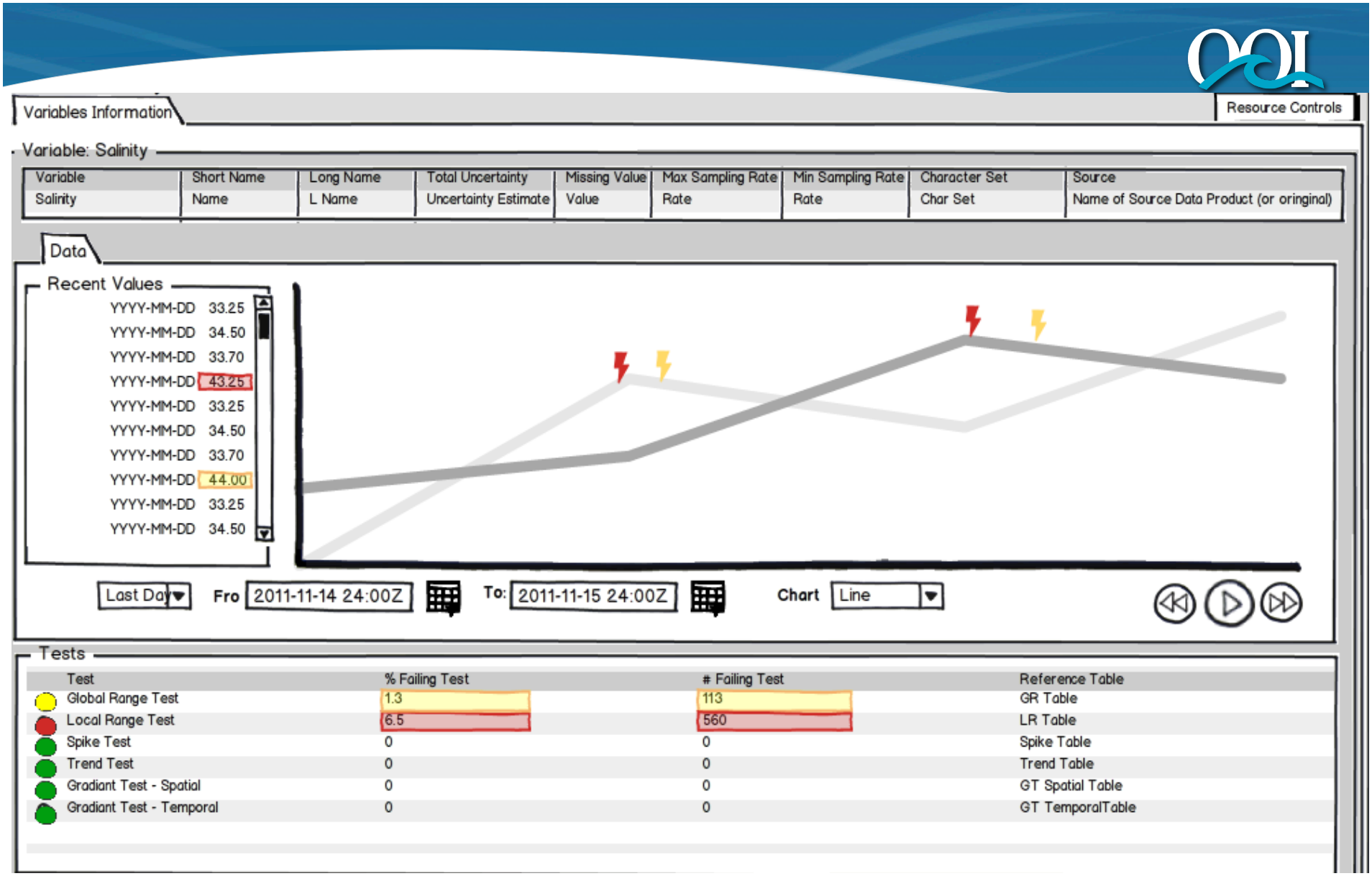
lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Contacts

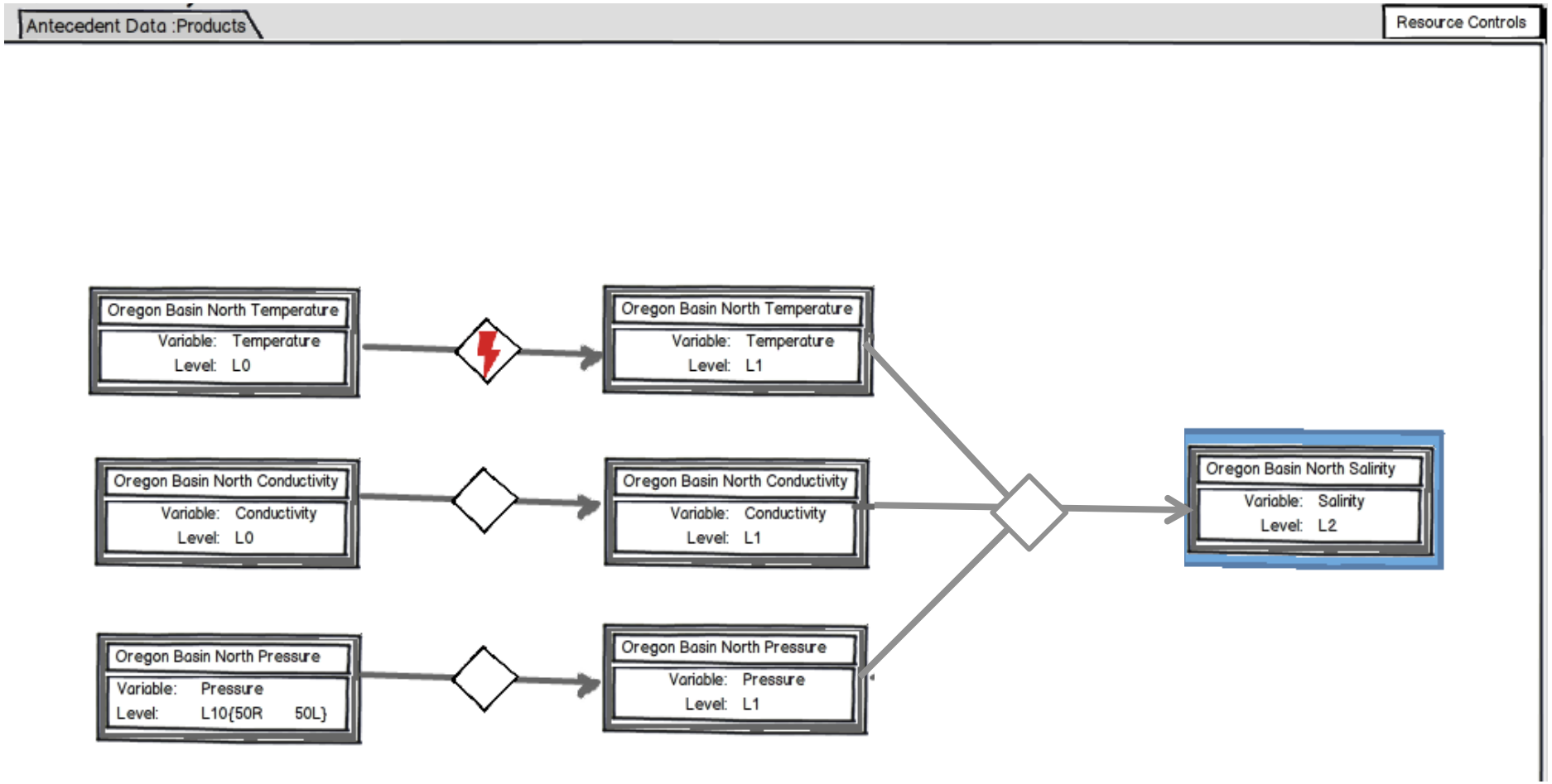
Owner:	Owner Name
Email:	Owner Email
Phone:	(+1)555-555-5555
PI:	PI Name

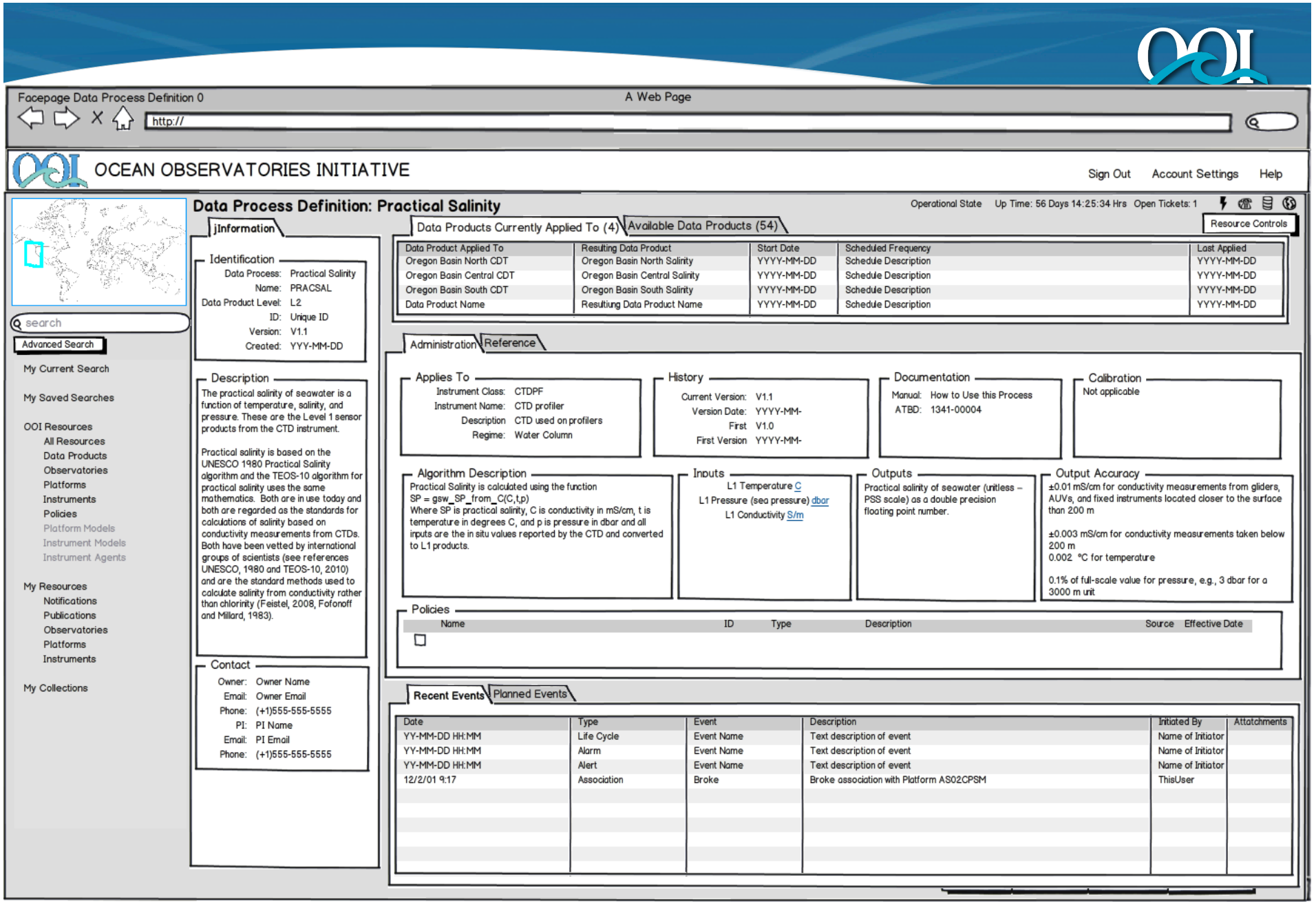
Status Page


Status Data Product 0
A Web Page
http://
OCEAN OBSERVATORIES INITIATIVE
Sign Out
Account Settings
Help
Data Product: Oregon Basin South Salinity
Operational State
Up Time: 56 Days 14:25:34 Hrs
Open Tickets: 1
Resource Controls
search
Advanced Search
My Current Search
My Saved Searches
OOI Resources
All Resources
Data Products
Observatories
Platforms
Instruments
Policies
Platform Models
Instrument Models
Instrument Agents
My Resources
Notifications
Publications
Observatories
Platforms
Instruments
My Collections
Information
Identification
Name: Oregon Basin South Salinity
Product Level: L2
ID: Unique ID
Registered: YYYY-MM-DD
Version: Current
Data Bounds
Map
Geospatial Extent
N
W 00.0000 00.0000 E
S
Vertical Extent
0000
0000
Temporal Extent
YYYY-MM-DD HH:MM:SS To YYYY-MM-DD HH:MM:SS
Contacts
Owner: Owner Name
Email: Owner Email
Phone: (+1)555-555-5555
PI: PI Name
Email: PI Email
Phone: (+1)555-555-5555
Project Information
Project Project
Data Contact: Contact Name
Email: Contact Email
Metadata Contact: Contact Name
Email: Contact Email
Variables Information
Variable: Salinity
Variable | Short Name | Long Name | Total Uncertainty | Missing Value | Max Sampling Rate | Min Sampling Rate | Character Set | Source
Salinity | Name | L Name | Uncertainty Estimate | Value | Rate | Rate | Char Set | Name of Source Data Product (or oringinal)
Data
Recent Values
YYYY-MM-DD 33.25
YYYY-MM-DD 34.50
YYYY-MM-DD 33.70
YYYY-MM-DD 43.25
YYYY-MM-DD 33.25
YYYY-MM-DD 34.50
YYYY-MM-DD 33.70
YYYY-MM-DD 44.00
YYYY-MM-DD 33.25
YYYY-MM-DD 34.50
Last Day
Fro 2011-11-14 24:00Z
To: 2011-11-15 24:00Z
Chart Line
Tests
Test | % Failing Test | # Failing Test | Reference Table
Global Range Test | 1.3 | 113 | GR Table
Local Range Test | 6.5 | 560 | LR Table
Spike Test | 0 | 0 | Spike Table
Trend Test | 0 | 0 | Trend Table
Gradiant Test - Spatial | 0 | 0 | GT Spatial Table
Gradiant Test - Temporal | 0 | 0 | GT TemporalTable
Inputs
Level | QC Level | Type | Units | Source | Process
L1 | C | Temperature | C | Data Product Name | Data Process Name
L1 | C | Pressure | dbar | Data Product Name | Data Process Name
L1 | C | Conductivity | S/m | Data Product Name | Data Process Name
Next Variable Here
Recent Events
Planned Events
Date | Type | Event | Description | Initiated By | Attatchments
YY-MM-DD HH:MM | Life Cycle | Event Name | Text description of event | Name of Initiator
YY-MM-DD HH:MM | Alarm | Event Name | Text description of event | Name of Initiator
YY-MM-DD HH:MM | Alert | Event Name | Text description of event | Name of Initiator
12/2/01 9:14 | Command | Command Instrument | 2 Commands Issued | ThisUser
12/2/01 9:15 | State Change | Power Off | | ThisUser
12/2/01 9:17 | Association | Broke | Broke association with Platform AS02CPSM | ThisUser


Variables Information
Resource Controls
Variable: Salinity
Variable
Salinity
Short Name
Name
Long Name
L Name
Total Uncertainty
Uncertainty Estimate
Missing Value
Value
Max Sampling Rate
Rate
Min Sampling Rate
Rate
Character Set
Char Set
Source
Name of Source Data Product (or original)
Data
Recent Values
YYYY-MM-DD 33.25
YYYY-MM-DD 34.50
YYYY-MM-DD 33.70
YYYY-MM-DD 43.25
YYYY-MM-DD 33.25
YYYY-MM-DD 34.50
YYYY-MM-DD 33.70
YYYY-MM-DD 44.00
YYYY-MM-DD 33.25
YYYY-MM-DD 34.50
Last Day
Fro
2011-11-14 24:00Z
To:
2011-11-15 24:00Z
Chart
Line
Tests
Test
% Failing Test
# Failing Test
Reference Table
Global Range Test
1.3
113
GR Table
Local Range Test
6.5
560
LR Table
Spike Test
0
0
Spike Table
Trend Test
0
0
Trend Table
Gradiant Test - Spatial
0
0
GT Spatial Table
Gradiant Test - Temporal
0
0
GT TemporalTable

Lineage


Antecedent Data :Products
Resource Controls
Oregon Basin North Temperature
Variable: Temperature
Level: L0
Oregon Basin North Temperature
Variable: Temperature
Level: L1
Oregon Basin North Conductivity
Variable: Conductivity
Level: L0
Oregon Basin North Conductivity
Variable: Conductivity
Level: L1
Oregon Basin North Pressure
Variable: Pressure
Level: L10{50R 50L}
Oregon Basin North Pressure
Variable: Pressure
Level: L1
Oregon Basin North Salinity
Variable: Salinity
Level: L2


Facepage Data Process Definition 0
A Web Page
http://
OCEAN OBSERVATORIES INITIATIVE
Sign Out
Account Settings
Help
Data Process Definition: Practical Salinity
Operational State
Up Time: 56 Days 14:25:34 Hrs
Open Tickets: 1
Resource Controls
search
Advanced Search
My Current Search
My Saved Searches
OOI Resources
All Resources
Data Products
Observatories
Platforms
Instruments
Policies
Platform Models
Instrument Models
Instrument Agents
My Resources
Notifications
Publications
Observatories
Platforms
Instruments
My Collections
jInformation
Identification
Data Process: Practical Salinity
Name: PRACSAL
Data Product Level: L2
ID: Unique ID
Version: V1.1
Created: YYY-MM-DD
Description
The practical salinity of seawater is a function of temperature, salinity, and pressure. These are the Level 1 sensor products from the CTD instrument.
Practical salinity is based on the UNESCO 1980 Practical Salinity algorithm and the TEOS-10 algorithm for practical salinity uses the same mathematics. Both are in use today and both are regarded as the standards for calculations of salinity based on conductivity measurements from CTDs. Both have been vetted by international groups of scientists (see references UNESCO, 1980 and TEOS-10, 2010) and are the standard methods used to calculate salinity from conductivity rather than chlorinity (Feistel, 2008, Fofonoff and Millard, 1983).
Contact
Owner: Owner Name
Email: Owner Email
Phone: (+1)555-555-5555
PI: PI Name
Email: PI Email
Phone: (+1)555-555-5555
Data Products Currently Applied To (4)
Available Data Products (54)
Data Product Applied To
Resulting Data Product
Start Date
Scheduled Frequency
Last Applied
Oregon Basin North CDT
Oregon Basin North Salinity
YYYY-MM-DD
Schedule Description
YYYY-MM-DD
Oregon Basin Central CDT
Oregon Basin Central Salinity
YYYY-MM-DD
Schedule Description
YYYY-MM-DD
Oregon Basin South CDT
Oregon Basin South Salinity
YYYY-MM-DD
Schedule Description
YYYY-MM-DD
Data Product Name
Resultiung Data Product Name
YYYY-MM-DD
Schedule Description
YYYY-MM-DD
Administration
Reference
Applies To
Instrument Class: CTDPF
Instrument Name: CTD profiler
Description CTD used on profilers
Regime: Water Column
History
Current Version: V1.1
Version Date: YYYY-MM-
First V1.0
First Version YYYY-MM-
Documentation
Manual: How to Use this Process
ATBD: 1341-00004
Calibration
Not applicable
Algorithm Description
Practical Salinity is calculated using the function
SP = gsw_SP_from_C(C,t,p)
Where SP is practical salinity, C is conductivity in mS/cm, t is temperature in degrees C, and p is pressure in dbar and all inputs are the in situ values reported by the CTD and converted to L1 products.
Inputs
L1 Temperature C
L1 Pressure (sea pressure) dbar
L1 Conductivity S/m
Outputs
Practical salinity of seawater (unitless – PSS scale) as a double precision floating point number.
Output Accuracy
±0.01 mS/cm for conductivity measurements from gliders, AUVs, and fixed instruments located closer to the surface than 200 m
±0.003 mS/cm for conductivity measurements taken below 200 m
0.002 °C for temperature
0.1% of full-scale value for pressure, e.g., 3 dbar for a 3000 m unit
Policies
Name
ID
Type
Description
Source
Effective Date
Recent Events
Planned Events
Date
Type
Event
Description
Initiated By
Attatchments
YY-MM-DD HH:MM
Life Cycle
Event Name
Text description of event
Name of Initiator
YY-MM-DD HH:MM
Alarm
Event Name
Text description of event
Name of Initiator
YY-MM-DD HH:MM
Alert
Event Name
Text description of event
Name of Initiator
12/2/01 9:17
Association
Broke
Broke association with Platform AS02CPSM
ThisUser

Administration | Reference

Applies To

Instrument Class: CTDPF
Instrument Name: CTD profiler
Description: CTD used on profilers
Regime: Water Column

History

Current Version: V1.1
Version Date: YYYY-MM-
First: V1.0
First Version: YYYY-MM-

Documentation

Manual: How to Use this Process
ATBD: 1341-00004

Calibration

Not applicable

Algorithm Description

Practical Salinity is calculated using the function
SP = gsw_SP_from_C(C,t,p)
Where SP is practical salinity, C is conductivity in mS/cm, t is temperature in degrees C, and p is pressure in dbar and all inputs are the in situ values reported by the CTD and converted to L1 products.

Inputs

L1 Temperature C
L1 Pressure (sea pressure) dbar
L1 Conductivity S/m

Outputs

Practical salinity of seawater (unitless – PSS scale) as a double precision floating point number.

Output Accuracy

±0.01 mS/cm for conductivity measurements from gliders, AUVs, and fixed instruments located closer to the surface than 200 m

±0.003 mS/cm for conductivity measurements taken below 200 m
0.002 °C for temperature

0.1% of full-scale value for pressure, e.g., 3 dbar for a 3000 m unit

Thanks! Questions?

For further info:

CI Product specification (human readable)

https://confluence.oceanobservatories.org/display/CIPROD/CI+Product+Specification

Use Scenario (human readable)

https://confluence.oceanobservatories.org/display/CIDev/Release+2+Acceptance+Scenarios

User Interface

Userexperience.oceanobservatories.org

Resource Attributes

https://confluence.oceanobservatories.org/display/syseng/CIAD+APP+Resource+Model

Architecture

https://confluence.oceanobservatories.org/display/syseng/Architecture+and+Design

Data Model

https://confluence.oceanobservatories.org/display/syseng/CIAD+DM+SV+Common+Data+Model